

<i>Acer rubrum</i> L.	<i>Azalea lutea</i> L.
<i>Cornus florida</i> L.	<i>Pyrus melanocarpa</i> (Michx.)
<i>Sassafras variifolium</i> (Salisb.)	Willd.
Ktze.*	<i>Clethra acuminata</i> Michx.
<i>Chionanthus virginica</i> L.*	<i>Gaylussacia resinosa</i> T. & G.
<i>Castanea pumila</i> (L.) Mill.*	<i>Leucothoë recurva</i> (Buckley) Gray.
<i>Hicoria glabra</i> (Mill.) Britton	<i>Rhus copallina</i> L.
<i>Amelanchier canadensis</i> (L.)	<i>Myrica asplenifolia</i> L.
Medic.	<i>Amorpha fruticosa</i> L.
<i>Halesia carolina</i> L.	<i>Robinia hispida</i> L.
<i>Symplocos tinctoria</i> (L.) L'Her.*	<i>Sambucus canadensis</i> L.
<i>Robinia Pseudo-Acacia</i> L.	
<i>Hamamelis virginica</i> L.*	
<i>Pinus rigida</i> Mill.	
<i>Acer pennsylvanicum</i> L.*	
<i>Oxydendron arboreum</i> (L.) DC.	
<i>Nyssa sylvatica</i> L.	
<i>Liriodendron Tulipifera</i> L.	
<i>Populus grandidentata</i> Michx.	
<i>Betula lutea</i> Michx. f.	
<i>Juniperus virginia</i> L.*	

It is interesting to note that eleven of the seventeen species of shrubs belong to the Ericaceae. Of the arborescent species, six belong to the Fagaceae and four to the Pinaceae. Nearly all of the other arborescent species represent different families.

BILTMORE FOREST SCHOOL

## A NEW SPECIES OF *DEWALQUEA* † FROM THE AMERICAN CRETACEOUS ‡

BY EDWARD W. BERRY.

The genus *Dewalquea* was founded by Saporta and Marion in 1874 § upon remains from the Senonian of Westphalia communicated by Debey and named by him in manuscript *Araliophyllum*, and on additional remains collected by those authors from the

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‡ Published by permission of the Director of the United States Geological Survey.

§ Saporta and Marion, Mém. cour. et des Sav. étrangers de l'Académie 37 : 55.

Paleocene of Gelinden, Belgium (Marnes heersiennes = Étage Thanétien). Three species were enumerated, *Devalquea haldemiana* and *Devalquea aquisgranensis* from the Westphalian Senonian and *Devalquea gelindenensis* from the basal Eocene. In the last thirty-five years several additional species have been referred to this genus. These include another species from the German Senonian (*Devalquea insignis*) described by Hosius and v. d. Marck;\* two species from the Cenomanian of Bohemia (*Devalquea coriacea* and *Devalquea pentaphylla*) described by Velenovsky; † two American species from the Dakota group (*Devalquea dakotensis* and *Devalquea primordialis*) described by Lesquereux, ‡ both of which are fragmentary and of uncertain relationship; a species from the Raritan of New Jersey (*Devalquea trifoliata*) described by Newberry; § and a species described by Heer ¶ from Greenland (*Devalquea groenlandica*) and subsequently recorded from Staten Island, New Jersey, North Carolina, and Alabama.

Hosius and v. d. Marck (loc. cit., p. 50) record the Eocene species from the Senonian of Westphalia but the remains are not of this species but fragments of *Devalquea haldemiana* which is common at that horizon. The European species *Devalquea insignis* is recorded by Heer ¶ from both the Atane and Patoot beds of Greenland and by Hollick\*\* from the Cretaceous of Staten Island but both of these determinations are based upon fragments of single leaves and are, in the writer's judgment, entirely untrustworthy. Attention should also be called to the possibility of *Celastrus arctica* Heer †† representing the leaflets of a *Devalquea*.

\* Hos. and v. d. Marck, Palaeont. 26: 172. pl. 32. f. 111-113; pl. 33. f. 109; pl. 34. f. 110; pl. 35. f. 123. 1880.

† Velenovsky, Fl. böhm. Kreidef. 3: 11, 14. pl. 1. f. 1-9; pl. 2. f. 2; pl. 8. f. 11, 12. 1884.

‡ Lesq., Fl. Dakota Group, 211. pl. 59. f. 5, 6. 1892. Geol. and Nat. Hist. Surv. Minn. 3: 18. pl. A. f. 10. 1893.

§ Newb., Fl. Amboy Clays, 129. pl. 22. f. 4-7. 1896.

¶ Heer, Fl. Foss. Arct. 6<sup>2</sup>: 87. pl. 29. f. 18, 19; pl. 42. f. 5, 6; pl. 44. f. 11. 1882.

¶ Heer, op. cit., 86. pl. 25. f. 7; pl. 33. f. 14-16. 1882; ibid. 7: 37. pl. 58 f. 3; pl. 62. f. 7. 1883.

\*\* Hollick, Mon. U. S. Geol. Surv. 50: 106. pl. 8. f. 24. 1907.

†† Heer, op. cit. 7: 40. pl. 61. f. 5, d, e.

This species was described from the Patoot beds of Greenland where it is sparsely represented. It is abundant, however, in the Upper Raritan of New Jersey, but of some scores of specimens examined by the writer all were detached and failed to show their habit of growth.

The botanical relationship of *Dewalquea* has always remained obscure and no better discussion of it is extant than that given by Saporta and Marion,\* who after comparing these leaves with those of *Ampelopsis*, *Arisaema*, *Anthurium* (Araceae), etc., arrive at the conclusion that they are prototypes of the tribe Helleboreae of the Ranunculaceae.

The new species, a description of which follows, may be called :

***Dewalquea Smithi* sp. nov.**

Leaves palmately decomposed, the petiole dividing into three principal branches, the angle of divergence varying from  $20^{\circ}$  to  $60^{\circ}$  and the two lateral branches forking at an acute angle 1 to 2 cm. above their base. The middle leaflet is lanceolate in outline, being widest in its central part and tapering almost equally to the acute apex and base. Length 7.5 cm. to 16 cm. Greatest width 2 cm. to 4 cm. Margin entire or serrate, usually entire below and serrate in the apical three fourths, sometimes with large aquiline-serrate teeth. Midrib stout. Secondaries regular, subopposite, parallel; about 20 pairs, branching from the midrib at angles varying from  $45^{\circ}$  to  $70^{\circ}$  usually about  $50^{\circ}$ , curving upward and running to the marginal teeth in some specimens as in the restoration. In other specimens and in entire margined forms they are camptodrome. The base of the leaflet extends downward to within 2 or 3 mm. of the forks of the petiole. Lateral leaflets more or less inequilateral, usually somewhat smaller than the middle leaflet. The internal leaflet is lanceolate, the outer lamina starting at or very near the point where the lateral branch of the petiole forks. The inner lamina, however, extends downward almost to the base of the lateral branch making the base markedly inequilateral. In general outline, marginal, and venation characters it is identical with the middle leaflet. The outer lateral leaflet is also somewhat inequilateral but less so than the internal lateral leaflet, its internal lamina starting at or near the fork and its outer lamina extending more or less below the fork. Marginal and venation characters as in the other leaflets.

\* Loc. cit., pp. 55-61.

This handsome species is common in the Tuscaloosa Formation at Whites Bluff on the right bank of the Warrior River 309 miles above Mobile, Alabama. A small collection of fossil plants from this outcrop containing no less than 27 specimens of



FIGURE I. Restoration of *Dewalquea Smithi* from the Tuscaloosa formation of Alabama ( $\frac{1}{2}$  nat. size).

this form. Several of these were complete and were sketched at the time they were collected, which proved fortunate, since the extremely arenaceous matrix did not withstand shipment very well. The museum material, while considerably broken, shows several entire detached leaflets and three or four basal

parts of the leaf showing the mode of division of the petiole. As a number of figures would be necessary to show the entire leaf a restoration of it is shown in the accompanying text-figure. This restoration is based entirely upon material representing all parts of the leaf and is therefore not hypothetical in any particular.

It is named in honor of Prof. E. A. Smith, the efficient state geologist of Alabama. Leaflets of this species, nearly all of which are terminal, are also common in the Middendorf clays near Langley, South Carolina.

This species is markedly distinct from the American species of *Dewalquea* previously described, all of which were apparently tripartite. Among the European species it is quite similar to the Senonian species *Dewalquea insignia* Hos. and v. d. Marck which is, however, entirely distinct. It is also similar to *Dewalquea coriacea* and *Dewalquea pentaphylla* described by Velenovsky from the Cenomanian of Bohemia.

As mentioned above this Alabama species shows entire and serrated forms and it is remarkable that wherever this genus has been found to occur in any abundance, two species are usually described, one entire and one with toothed margins. Thus in Germany *Dewalquea haldemiana* is entire while *Dewalquea insignis* is toothed, and probably both are the leaves of the same plant. In Bohemia *Dewalquea pentaphylla* is entire while *Dewalquea coriacea* is toothed. In the case of the Alabama plant it is believed that the entire and serrate leaves are specifically identical since the material shows a great many gradations in the size of the teeth and great variability regarding the proportions which the entire part bears to the toothed part on single leaflets.

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#### SHORTER NOTES

THE WEEPING WILLOW IN WINTER. — A large weeping willow on the university campus shows, in winter, such a complete change from its "weeping" habit that further information seems desirable. The slender unbranched twigs (one to two feet long),